IT314 - Software Engineering

G28 – Restaurant Reservation System

Lab 3 – Task 3: Sprints and Functional Point Analysis

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❖ Sprint 1: Registration and Login

➢ **Task**:

- Implement restaurant owner and customer registration (including basic validation).
- Implement login and reset password functionality for restaurant owners and customers.
- Set up payment gateway integration for registration fees and premium user fees.

Function Type	Count	Weighting Factor	Weighted Value
External Input (EI)	3	3	9
External Output (EO)	4	4	16
External Query (EQ)	3	3	9
Internal Logical File (ILF)	2	7	14
External Interface File (EIF)	2	5	10
Unadjusted Function Point (UFP)			58

- 3 External Input: Restaurant owner/customer registration data, Login credentials (email, password), Payment details for registration and premium fees.
- 4 External Output: Confirmation of successful registration, Login success/failure response, Password reset link or confirmation, Payment success/failure message.
- 3 External Query: Login validation, Password reset validation, Payment gateway query.
- 3 Internal Logic File: User database, Payment records.
- 2 External Interface File: Payment gateway transaction file, Email services**.**

- **Complexity Factor:**

Complexity factor	Value (F_i)
Backup and Recovery	2
Data Communication	1
Distributed Processing Function	0
Is Performance Critical?	1
Existing Operating Environment	2
Online Data Entry	2
Input Transaction Built Over Multiple Screens	2
Master Files Updated Online	3
Complexity of Inputs, Outputs, Files, Inquiries	1
Complexity of processing	2
Code Design for Reuse	2
Are Conversion/Installation Included in Design?	0
Multiple Installations	0
Application Designed to Facilitate Change by the User	1
$\sum F_i$	19

Complexity Adjustment Factor = 0.65 + 0.01 * $\sum F_i$ = 0.84

Function Point (FP) = UFC * Complexity Adjustment Factor

FP = 58 * 0.84
FP = 48

Hours per FP = 8 hrs (assumption)
Total Time (Hours) = 48*8 = **384 hrs**
Assuming 2.5 hrs per day per head, total hours per day = **25 hrs/day**
Estimate number of days required = 384/25 = **15 days**
Estimate Number of Weeks = **2 Weeks**

❖ Sprint 2: Restaurant Management

➢ **Task:**

- Implement functionality for restaurant owners to add restaurant details (name, address, cuisine type, seating capacity, etc.).
- Implement functionality for restaurant owners to update restaurant details.
- Implement functionality for restaurant owners to delete restaurant details.
- Implement functionality for restaurant owners to view the list of their restaurants.

Function Type	Count	Weighting Factor	Weighted Value
External Input (EI)	3	3	12
External Output (EO)	4	4	16
External Query (EQ)	2	3	6
Internal Logical File (ILF)	2	7	14
External Interface File (EIF)	0	5	0
Unadjusted Function Point (UFP)			48

- 3 External Input: Add restaurant details, Update restaurant details, Delete restaurant.
- 4 External Output: Confirmation of adding a restaurant, Confirmation of updating a restaurant, Confirmation of deleting a restaurant, List of Restaurant,
- 2 External Query: View list of restaurants, Check for existing restaurant details.
- 2 Internal Logic File: Restaurant database, Owner-restaurant mapping.
- 0 External Interface File: No direct external file interactions are anticipated for this sprint as it's focused on internal data management.

➢ Complexity Factor:

Complexity factor	Value (F_i)
Backup and Recovery	2
Data Communication	2
Distributed Processing Function	0
Is Performance Critical?	1
Existing Operating Environment	2
Online Data Entry	2
Input Transaction Built Over Multiple Screens	2
Master Files Updated Online	3
Complexity of Inputs, Outputs, Files, Inquiries	3
Complexity of processing	2
Code Design for Reuse	2
Are Conversion/Installation Included in Design?	0
Multiple Installations	0
Application Designed to Facilitate Change by the User	1
$\sum F_i$	22

Complexity Adjustment Factor = 0.65 + 0.01 * $\sum F_i$ = 0.87

Function Point (FP) = UFC * Complexity Adjustment Factor

FP = 48 * 0.87
FP = 41

Hours per FP = 8 hrs (assumption)
Total Time (Hours) = 41*8 = **328 hrs**
Assuming 2.5 hrs per day per head, total hours per day = **25 hrs/day**
Estimate number of days required = 384/25 = **13 days**
Estimate Number of Weeks = **2 Weeks**

❖ Sprint 3: Reservation System

➢ **Task:**

- Implement seat availability checking functionality.
- Develop table booking functionality with date and time selection.
- Implement booking confirmation and reminders
- Allow customers to view and update their reservations.
- Implement reservation cancellation functionality
- Allow customers to write reviews.
- Implement nominal charge in order to reserve the table

Function Type	Count	Weighting Factor	Weighted Value
External Input (EI)	6	3	18
External Output (EO)	4	5	20
External Query (EQ)	2	4	8
Internal Logical File (ILF)	2	7	14
External Interface File (EIF)	2	5	10
Unadjusted Function Point (UFP)			70

- 6 External Input: Seat Availability Check Input, Booking Input, Reservation Update Input, Reservation Cancellation Input, Review Input, Nominal Charge Input.
- 4 External Output: Seat Availability Results, Booking Confirmation, Reservation Update Confirmation, Reservation Cancellation Confirmation.
- 2 External Query: Reservation View Query, Review Retrieval Query.
- 2 Internal Logic File: Reservation Data File, Review Data File.
- 2 External Interface File: Payment Gateway Interface, Email/Notification Service Interface.

➢ Complexity Factor:

Complexity factor	Value (F_i)
Backup and Recovery	2
Data Communication	1
Distributed Processing Function	0
Is Performance Critical?	1
Existing Operating Environment	2
Online Data Entry	2
Input Transaction Built Over Multiple Screens	2
Master Files Updated Online	3
Complexity of Inputs, Outputs, Files, Inquiries	1
Complexity of processing	2
Code Design for Reuse	2
Are Conversion/Installation Included in Design?	0
Multiple Installations	0
Application Designed to Facilitate Change by the User	1
$\sum F_i$	19

Complexity Adjustment Factor = 0.65 + 0.01 * $\sum F_i$ = 0.84

Function Point (FP) = UFC * Complexity Adjustment Factor

FP = 70 * 0.84
FP = 59

Hours per FP = 8 hrs (assumption)
Total Time (Hours) = 59*8 = **472 hrs**
Assuming 2.5 hrs per day per head, total hours per day = **25 hrs/day**
Estimate number of days required = 472/25 = **19 days**
Estimate Number of Weeks = **3 Weeks**

❖ Sprint 4: Search and Filter Functionality

➢ **Task:**

- Implement search functionality for customers to find restaurants based on various filters (location, cuisine, rating, etc.)
- Integrate the search results with the reservation system.
- Develop UI for search and filter options

Function Type	Count	Weighting Factor	Weighted Value
External Input (EI)	1	3	3
External Output (EO)	1	5	5
External Query (EQ)	1	4	4
Internal Logical File (ILF)	1	7	7
External Interface File (EIF)	1	5	5
Unadjusted Function Point (UFP)			24

- 1 External Input: Search Filters Input
- 1 External Output: Search Results Display
- 1 External Query: Search and Filter Inquiry
- 1 Internal Logic File: Restaurant Data File
- 1 External Interface File: Reservation System Interface

- **Complexity Factor:**

Complexity factor	Value (F_i)
Backup and Recovery	2
Data Communication	1
Distributed Processing Function	0
Is Performance Critical?	1
Existing Operating Environment	2
Online Data Entry	2
Input Transaction Built Over Multiple Screens	2
Master Files Updated Online	3
Complexity of Inputs, Outputs, Files, Inquiries	1
Complexity of processing	2
Code Design for Reuse	2
Are Conversion/Installation Included in Design?	0
Multiple Installations	0
Application Designed to Facilitate Change by the User	1
$\sum F_i$	19

Complexity Adjustment Factor = 0.65 + 0.01 * $\sum F_i$ = 0.84

Function Point (FP) = UFC * Complexity Adjustment Factor

FP = 24 * 0.84
FP = 20

Hours per FP = 8 hrs (assumption)
Total Time (Hours) = 20*8 = **160 hrs**
Assuming 2.5 hrs per day per head, total hours per day = **25 hrs/day**
Estimate number of days required = 160/25 = **11 days**
Estimate Number of Weeks = **1.5 Weeks**

❖ Sprint 5: Customer Management & Premium Membership

➢ Task:

1. Develop Customer Profile Management:
    - Features to update customer details.
    - Ability to view reservation history.
2. Implement Premium Membership System:
    - Fee payment for premium membership.
    - Discount management for premium users.
3. Apply Discounts for Premium Users:
    - Ensure that discounts are applied during the reservation process for premium members.
4. Develop UI for Premium Membership and Discount Management:
    - Design and implement the user interface for managing premium membership and applying discounts.

Function Type	Count	Weighting Factor	Weighted Value
External Input (EI)	4	3	12
External Output (EO)	4	4	16
External Query (EQ)	3	3	9
Internal Logical File (ILF)	2	7	14
External Interface File (EIF)	2	5	10
Unadjusted Function Point (UFP)			61

- 4 External Inputs: Customer details update, Fee payment details for membership, Discount application data, Reservation data input.
- 4 External Outputs: Profile update confirmation, Membership fee payment confirmation, Discount application success/failure, Reservation details with discount.
- 3 External Queries: Reservation history fetch, Membership status validation, Discount validation during reservation.
- 2 Internal Logical Files**:** Customer database, Membership records.
- 2 External Interface Files: Payment gateway file, Discount system data.

➢ Complexity Factor:

Complexity factor	Value (F_i)
Backup and Recovery	3
Data Communication	2
Distributed Processing Function	1
Is Performance Critical?	2
Existing Operating Environment	3
Online Data Entry	3
Input Transaction Built Over Multiple Screens	2
Master Files Updated Online	4
Complexity of Inputs, Outputs, Files, Inquiries	2
Complexity of processing	3
Code Design for Reuse	2
Are Conversion/Installation Included in Design?	1
Multiple Installations	0
Application Designed to Facilitate Change by the User	1
$\sum F_i$	29

Complexity Adjustment Factor = 0.65+ 0.01 * $\sum F_i$ = 0.94

Function Point (FP) = UFC * Complexity Adjustment Factor

FP = 61 * 0.94
FP = 57.34

Hours per FP = 8 hrs (assumption)
Total Time (Hours) = 57 * 8 = **456 hrs**
Assuming 2.5 hrs per day per head, total hours per day = **25 hrs/day**
Estimate number of days required = 456/25 = **18 days**
Estimate Number of Weeks = **2.5 Weeks**